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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,347	08/26/2003	Jian J. Chen	2328-050A	3505

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LOWE HAUPTMAN GILMAN & BERNER, LLP
Suite 300
1700 Diagonal Road
Alexandria, VA 22314

EXAMINER	
ALEJANDRO MULERO, LUZ L	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/647,347	CHEN ET AL.	
	Examiner	Art Unit	
	Luz L. Alejandro	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *26, 31* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The finality of the office action mailed 3/9/05 has been withdrawn and new rejections are imposed as stated below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland et al., U.S. Patent 5,759,280 in view of Yoshida et al., U.S. Patent 5,690,781 and Savas, U.S. Patent 5,983,828.

Holland et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor

including a plasma excitation coil having a center axis and plural parallel connected windings adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship.

Holland et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Yoshida et al. discloses moving a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 6A-6B and their descriptions). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Holland et al. so as to include the claimed positioning step in order to achieve a uniform plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density

distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Holland et al. modified by Toshiba et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland et al., U.S. Patent 5,759,280 in view of Ni et al., U.S. Patent 6,229,264 and Savas, U.S. Patent 5,983,828.

Holland et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil having a center axis and plural parallel connected windings adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship.

Holland et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Ni et al. discloses moving different positions of a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 1-2 and their description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Holland et al. so as to include the claimed positioning step in order to achieve a more controlled plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process

of Holland et al. modified by Ni et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al., U.S. Patent 5,795,429 in view of Yoshida et al., U.S. Patent 5,690,781 and Savas, U.S. Patent 5,983,828.

Ishii et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil 24 having a center axis and plural parallel connected windings (24a, 24b) adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship (see fig. 9 and its description).

Ishii et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from

processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Yoshida et al. discloses moving a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 6A-6B and their descriptions). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ishii et al. so as to include the claimed positioning step in order to achieve a uniform plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ishii et al. modified by Toshiba et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al., U.S. Patent 5,795,429 in view of Ni et al., U.S. Patent 6,229,264 and Savas, U.S. Patent 5,983,828.

Ishii et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil 24 having a center axis and plural parallel connected windings (24a, 24b) adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship (see fig. 9 and its description).

Ishii et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Ni et al. discloses moving different positions of a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 1-2 and their description). In

view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ishii et al. so as to include the claimed positioning step in order to achieve a more controlled plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Ishii et al. modified by Ni et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al., U.S. Patent 6,164,241 in view of Yoshida et al., U.S. Patent 5,690,781 and Savas, U.S. Patent 5,983,828.

Chen et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil having a center axis and plural parallel connected

windings adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship (see fig. 6 and its description).

Chen et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Yoshida et al. discloses moving a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 6A-6B and their descriptions). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Chen et al. so as to include the claimed positioning step in order to achieve a uniform plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular

processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Chen et al. modified by Toshiba et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al., U.S. Patent 6,164,241 in view of Ni et al., U.S. Patent 6,229,264 and Savas, U.S. Patent 5,983,828.

Chen et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil having a center axis and plural parallel connected windings adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship (see fig. 6 and its description).

Chen et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Ni et al. discloses moving different positions of a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 1-2 and their description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Chen et al. so as to include the claimed positioning step in order to achieve a more controlled plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process

of Chen et al. modified by Ni et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al., U.S. Patent 6,288,493 in view of Yoshida et al., U.S. Patent 5,690,781 and Savas, U.S. Patent 5,983,828.

Lee et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil 310 having a center axis and plural parallel connected windings (310a, 310b, 310c, 310d) adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil 310c surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship (see fig. 3B and its description).

Lee et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from

processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Yoshida et al. discloses moving a coil to assist in controlling the electric field distribution and plasma density distribution of the processor (see figs. 6A-6B and their descriptions). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee et al. so as to include the claimed positioning step in order to achieve a uniform plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee et al. modified by Toshiba et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Claims 26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al., U.S. Patent 6,288,493 in view of Ni et al., U.S. Patent 6,229,264 and Savas, U.S. Patent 5,983,828.

Lee et al. shows the invention substantially as claimed including a method of controlling the plasma flux distribution on a workpiece of an inductive plasma processor including a plasma excitation coil 310 having a center axis and plural parallel connected windings (310a, 310b, 310c, 310d) adapted to be driven by an excitation source, the plural parallel connected windings being concentric with the axis so an exterior winding of the coil 310c surrounds the remainder of the coil, the method comprising positioning the exterior winding relative to the remainder of the coil so the plasma density incident on the workpiece has a predetermined desired relationship (see fig. 3B and its description).

Lee et al. does not expressly disclose the positioning step including turning the exterior winding and another winding of the coil relative to each other about the axis; the exterior winding being turned relative to the another winding to assist in controlling azimuthal electric field distribution and azimuthal plasma density distribution of the processor; and the method being performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor. Ni et al. discloses moving different positions of a coil to assist in controlling the electric field distribution

and plasma density distribution of the processor (see figs. 1-2 and their description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee et al. so as to include the claimed positioning step in order to achieve a more controlled plasma distribution.

Concerning wherein the method is performed on a plurality of different processors of the same type having differing azimuthal electric field and plasma density distributions from processor to processor and the exterior winding of each particular processor is turned relative to the remainder of the coil of the particular processor until tests indicate optimum uniform plasma distribution is achieved in each processor, Savas discloses an apparatus with different processors 102a, 102b that operate independently (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee et al. modified by Ni et al. so as to use this process on a plurality of different processors because in such a way each processor can have its plasma distribution adjusted based upon the particular process being conducted in the processor.

Response to Arguments

Applicant's arguments with respect to claims 26 and 31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luz L. Alejandro
Primary Examiner
Art Unit 1763

April 11, 2006